TEST EXAMPLES

Module 1

1. What would be the strategic, operational and tactical needs of a State Road Transport Corporation?

2. What do you think are the functional management areas in a large Students hostel?

3. Explain how data will be processed in a bank when a cheque is presented by a customer and payment made to him (assume the bank uses computers)

Module 2

4. What benefits do you expect if an information system for a hostel is designed?

5. In designing an information system for a hostel what constraints should be taken into account during feasibility analysis?

Module 3

6. A hostel warden states the following requirements for a hostel information system: "Our hostel has 500 rooms and 4 messes. Currently, there are 1000 students all in 2 seated rooms. They eat in any one of the messes but can get a rebate if they inform and do not eat for at least 4 consecutive days. Besides normal menu, extra items are also given to students when they ask for it. Such extras are entered in an extras book. At the end of the month a bill is prepared based on the normal daily rate and extras and given to each student. We find that bill preparation is delayed. We are also not able to keep proper track of payments and billing for extras. We need a system to streamline this". Obtain a document flow diagram for the problem described above.

Module 4

7. Is it essential that an operationally feasible solution should be technically feasible? Discuss with examples.

8. A system costs Rs.1 lakh to install and Rs.10,000 per month as recurring expenses. The benefit per year is Rs.1.5 lakhs. Assuming an interest rate of 12% per annum, what is the pay back period of the investment?
9. A project costs Rs.2 lakhs and the net benefits are Rs.50,000 (1\textsuperscript{st} year), Rs.80,000 (2\textsuperscript{nd} year), Rs.90,000 (3\textsuperscript{rd} year), Rs.70,000 (4\textsuperscript{th} year), Rs.50,000 (5\textsuperscript{th} year), and Rs.30,000 (6\textsuperscript{th} year). Assuming 10% per annum interest rate, would you proceed with this project if your criterion is cost/benefit?

Module 5

10. A magazine is published monthly and is sent by post to its subscribers. Two months before the expiry of subscription, a reminder is sent to the subscribers. If subscription is not received within a month, another reminder is sent. If renewal subscription is not received up to two weeks before the expiry of the subscription, the subscriber's name is removed from the mailing list and the subscriber informed. Obtain logical DFDs for this problem and also a flowchart.

11. Obtain a physical DFD for a simple payroll system described below. A list of employees with their basic pay is sent to a clerk. He calculates the gross pay using standard allowances which are known for each pay slab. Deduction statements such as loan repayment, subscription to associations etc. are also sent to another clerk who matches these slips with the slips of gross pay and calculates net pay. This slip is used by a third clerk to write out pay cheques for each employee and sent to respective employees. The total net pay amount paid and bills paid are also computed.

12. If the procedure of the above problem is to be computerised, obtain a logical DFD for the computer-based system.

Module 6

13. An organization maintains an employee file in which each record has the following data:
   (Employee No., employee name, employee gross pay).
   It has been decided to increase the pay as per the following formula:
   For pay of Rs.1000 or less increase 15%
   For pay of more than Rs.1000 but up to Rs.2500 increase 10%.
   For pay over Rs.2500 increase 5%.
   (i) Write a structured English processing rule corresponding to the above policies
   (ii) Express the policies as a decision table.

14. An offshore gas company bills its customer according to the following rate schedule:
   First 500 litres Rs. 10 (flat)
   Next 300 litres Rs.1.25 per 100 litres
   Next 30,000 litres Rs.1.20 per 100 litres
Next 100,000 litres Rs.1.10 per 100 litres
Above this Rs.1.00 per 100 litres.

The input record has customer identification, name and address, meter readings, past and present. Write a structured English procedure to obtain a bill for the customer.

15. Obtain a decision table for an automatic stamps vending machine with the following specifications:
   (i) To dispense 20, 15, 10, 5 paise stamps
   (ii) To accept 50, 25, 10, 5 paise coins
   (iii) Do not return change if it is necessary to return more than two coins of the same denomination. In such a case return the customer's coin and turn on "no change" light.

   The machine should dispense a stamp, the right amount of change, no stamp available, no change available signals etc.

16. You want to go to Delhi from Bangalore. There are three flights per day; early morning, late morning and evening. You would like to go on 21.4.04 by early morning flight. If it is not available you will take the late morning flight. If neither is available you are willing to take any flight on 22.4.04 but prefer early and late morning flights. Obtain a decision tree for this word statement. Is decision table suitable for this problem? If not why?

Module 7

17. Design a form to be used by a salesman to report to the office about sales executed by him at different customer locations

18. Design a group classification code to code (i) motor vehicles, (ii) music cassettes, and (iii) books

19. Add a Modulus-11 check digit to the codes (i) 48467, (ii) 96432, and (iii) 87646257.

20. Modulus-37 check is suitable for alphanumeric codes. Add a modulus-37 character to the codes (i) 4AB9W, (ii) XBY483, and (iii) CAZ4642.

21. What is the purpose of batch control record? What is the type of information contained in a batch control record?
   A set of data records for student examination results has the following format:
   Roll no. Name Marks (out of 100)
   Paper 1 Paper 2 Paper 3 Paper 4
   Design for these records a batch control record and a record control field and any other appropriate checks for the fields.
22. Design a dialogue hierarchy and the screens for a system used to reserve seats in long distance buses.

Module 8

23. Develop E-R diagram for the following:
   - Customer withdraws money from his account
   - Students write examinations.
   - Students attend classes
   - Professors write books
   - Driver drives a car

23. Student's records in a University are kept by various sections: Hostel, Health Centre, Academic Office, major departments, Accounts Section and Library. If each of these sections maintains its own file-based system for processing, what problems do you foresee? Give examples.

Module 9

24. How do you select objects from a requirement specification? Given the following requirement statement, select potential objects.
   - A list of employers with their basic pay is sent to a clerk. He calculates the gross pay using standard allowances which are known for each pay slab. Deduction statements such as loan repayment, subscription to association etc., are also sent to another clerk who matches these slips with the slips of gross pay and calculates net pay. This step is used by another clerk to write out pay cheques for each employee and sent to respective employees. The total pay bills computed is also computed.

25. Give a brief requirements specification for a bus ticket reservation system. Model it using objects.

Module 10

26. Prepare a print chart for stores data processing system.

27. Pick the appropriate graphics presentation for the following applications:
   (i) Relative enrollment of students in various departments in a University.
   (ii) Growth of student strength in a department over a period of 10 years.
   (iii) Sales percent of a product in 6 regions of a country.
   (iv) Proportion of total revenue of a state from direct taxes, indirect taxes, public loan, land revenue, income from public sector companies, and
miscellaneous receipts.

Module 11.

28. Give a HTML code to display
   
   **Introduction to e-Commerce**
   
   This is a **new book**

29. Give an example of an extranet

Module 12

30. A college has 1500 students whose final examination results are declared using computer processing. There are 5 subjects, each carrying 100 marks. Classes are awarded as follows:
   
   Marks 60 or above, I class
   Marks 50 or above, II class
   Marks below 50, Fail
   
   Device an appropriate control scheme for processing results.

31. Design a proof figure for the above example.

Module 13

32. Given a plain text:

   **THIS IS A SAMPLE SENTENCE FOR ENCRYPTION.**

   Apply the permutation (231564) and the substitution: (letter \(\rightarrow\) letter + 6) and obtain the cipher text.

33. How does DES hardware encrypt the following hexadecimal plain text
   A1907FBCD986543201FED14E890ABCA5

34. Given two prime numbers 23 and 41 design a RSA system

35. Explain how cash transactions take place in E-Commerce. What special precautions should be taken by a bank to ensure that a customer does not double spend the same electronic coins issued to him/her?